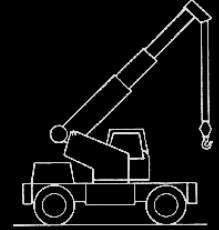
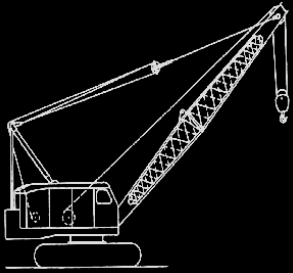


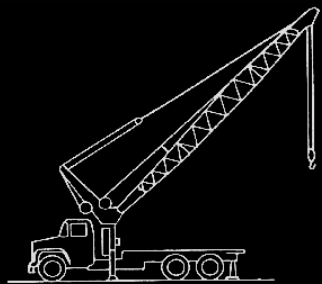
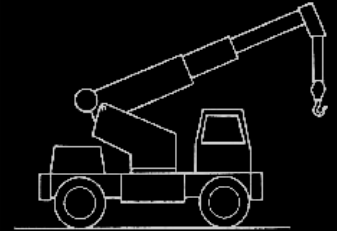
Crane Selection, Site Review & Set-Up



Key Concepts:



- Considerations for proper crane selection and the various types of mobile cranes used in construction.
- Factors that affect stability, capacity and the proper set-up of mobile cranes.



Crane Selection

Considerations:

- The weights, dimensions and lift radii expected.
- The type of lifting to be done.
- Serviceability of the equipment.
- The site conditions.

Recommendations:

- Be capable of making all its lifts in its standard configuration.
- 5% working margin.

Types of Cranes

- Crawler Cranes
- Locomotive Cranes
- Wheel-Mounted Cranes (Multiple Control Stations)
- Wheel-Mounted Cranes (Single Control Stations)
- Commercial Truck-Mounted Cranes

Learning Opportunity

1. When selecting a mobile crane, what are some things that its size and characteristics must be considered against.
2. Name four (4) different types of cranes used in the industry.

Site Review & Crane Set-Up

Jobsite Conditions:

- Supporting Surfaces
- Access & Stability (transporting a crane)
- Working area

Assembly Hazards:

- Lattice Boom Assembly & Disassembly
- Reeving the load line
- Leveling the crane

Supporting Surfaces

- Soil Conditions must be sufficient.
- Blocking & Cribbing should be used.

VIOLATION



Blocking or Cribbing

1. Spreads out the load so the supporting surface can support it.



2. Transmits the load without bending or breaking.



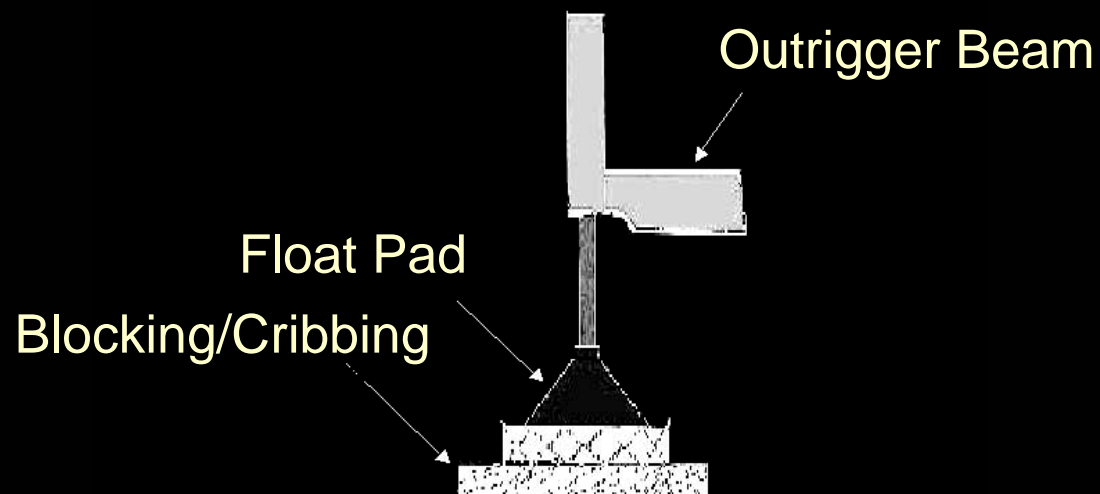
Calculating Blocking/Cribbing Area

Method 1

Area of float (in square feet) x 3 = Blocking area (in square feet)

Method 2

Capacity of crane (in tons) / 5 = Blocking area (in square feet)



Blocking or Cribbing



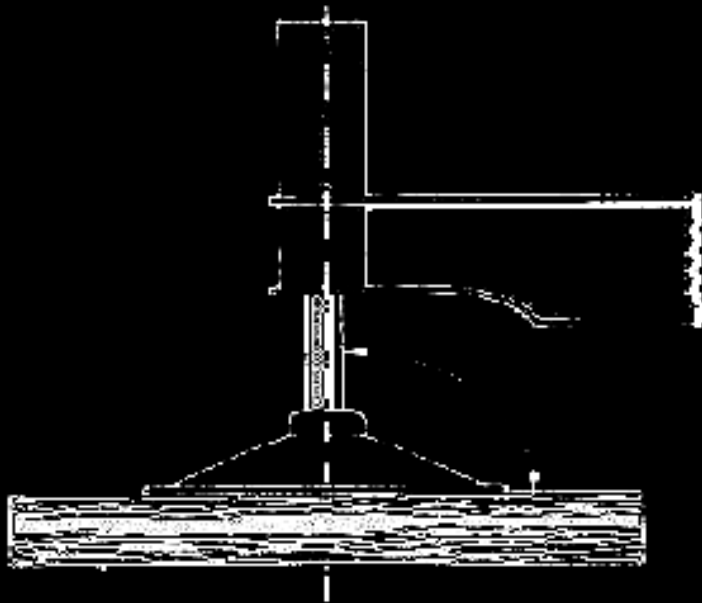
Transmitting the Load -

Properly placed with
no gaps or spaces
between pieces.

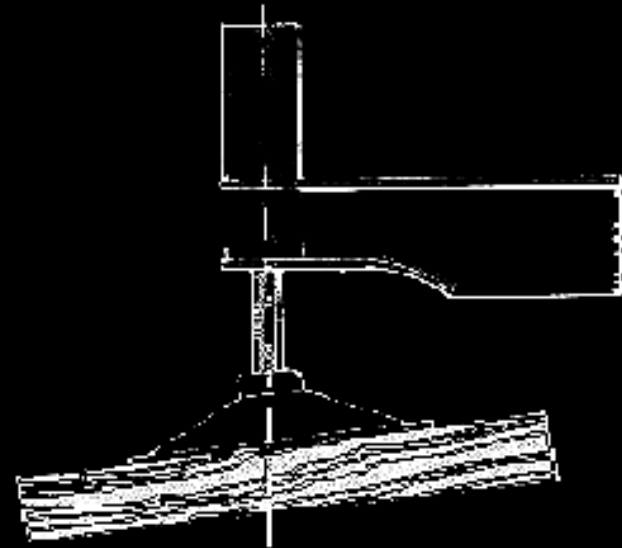
VIOLATION

Blocking or Cribbing

Transmitting the Load; must always be level.



RIGHT



WRONG

Blocking or Cribbing

Transmitting the Load; must always be stable and never block under outrigger beams inside the floats.



WRONG

VIOLATION



Mats

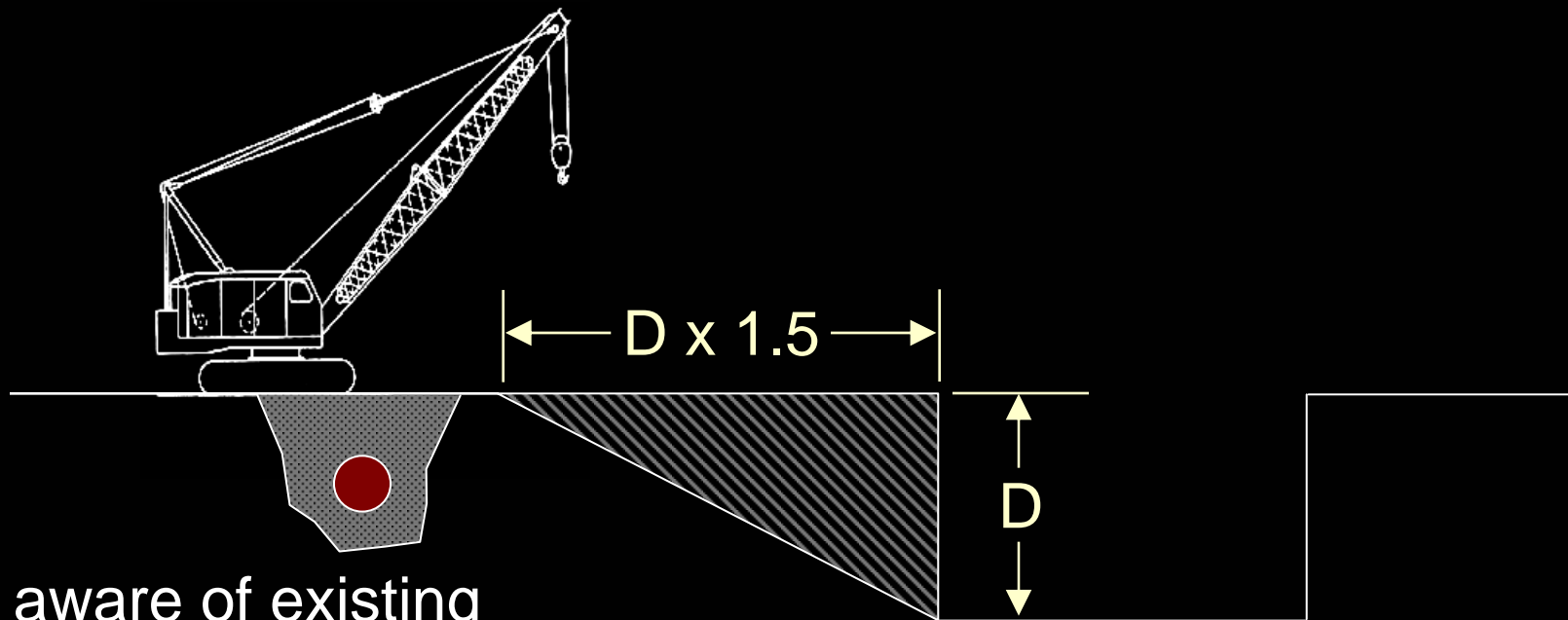
- Usually made of hardwood.
- Through bolted together
- 8 – 12 inches thick.



If soil conditions are poor enough to require mats, the input of a soil engineer may be needed. Do not make any assumptions.

Working Near Excavations

Recommended Safe Work Practice: *Affected Zone*



Be aware of existing underground utilities and backfill.

Affected Zone (Depth $\times 1.5$)
*Average Soil Only

Access and Usability

Check for these problems and conditions:

- Compact and traction of surfaces
- Overhead clearance
- Tight turns
- Bridge capacities
- Weight laws
- Special permits needed

Transporting a Crane

- Follow all manufacturer's recommendations and ensure crew is qualified and competent to make decisions.

ANSI requires that hook balls and blocks be lashed or secured during transit.



Work Area

- Site allows for full extension of outriggers or crawlers.
- Minimum clearance of 2 feet from all objects for counterweight.
- Must be level within manufacturer's specifications.



Working Near Airports

- Notification to the Federal Aviation Administration may be required.
- Advisory Circular 70/7460-2K, *Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace*.
- Form 7460-1 must be filed as early as possible but not less than 30 days before construction begins.

Working in Traffic

Manual of Uniform Traffic Control Devices

- Signs
- Barricades
- Trained Signal Persons

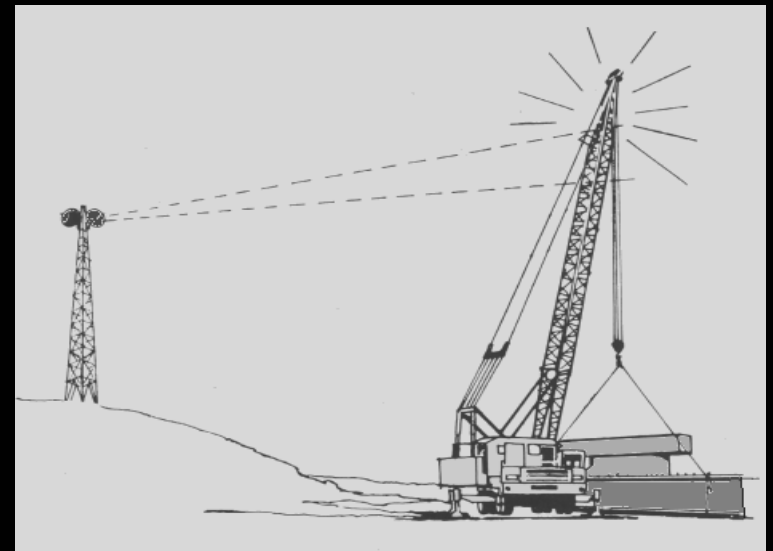
MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F.



Working Near Transmitters

The following precautions shall be taken when necessary to dissipate induced voltages:

- Electrical ground directly to the upper rotating supporting the boom.
- Ground jumper cables.
- Combustible and flammable material shall be removed from the immediate area.

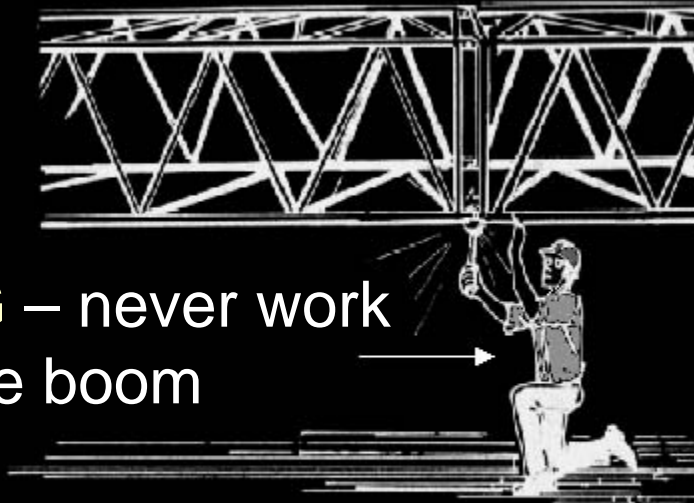


Lattice Boom Assembly and Disassembly

- Area must be level, firm and large enough to allow room to lay out boom.
- Read and understand manufacturer's instructions (before assembly).
- Sufficient blocking must be available.
- Proper tools available, including ladders.

Lattice Boom Assembly and Disassembly Hazard

WRONG – never work under the boom



Follow manufacturers' specifications on boom assembly and disassembly.

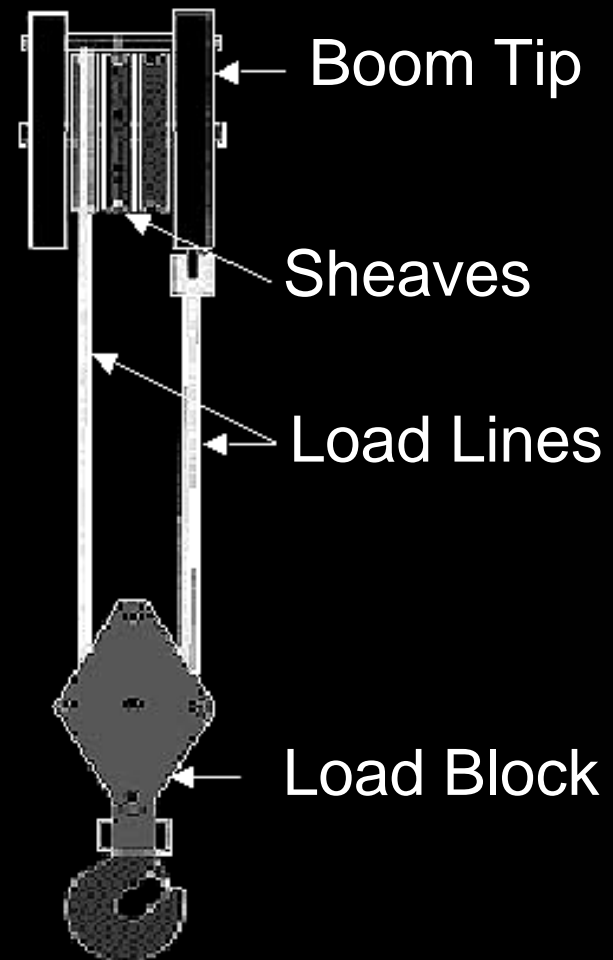


Boom must be secured against collapse when working inside.

Reeving the Load Line

Operator is familiar with following terms:

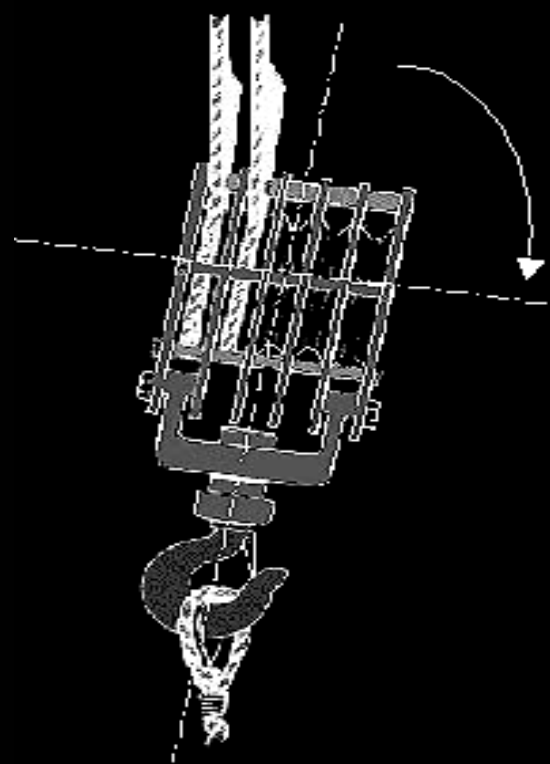
- Available line pull
- Allowable line pull or Safe Working Load (SWL)
- Total Load
- Friction Loss



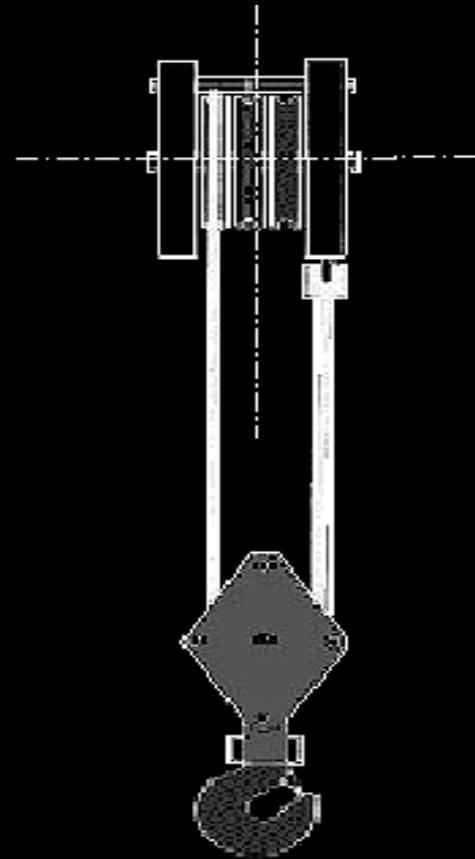
Two-Part Reeve

Reeving Hazards

Side loading the hoist block.



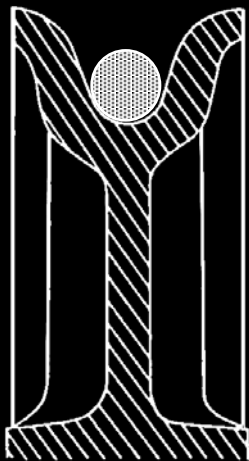
WRONG



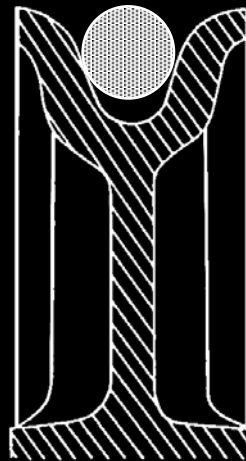
RIGHT

Reeving Hazards

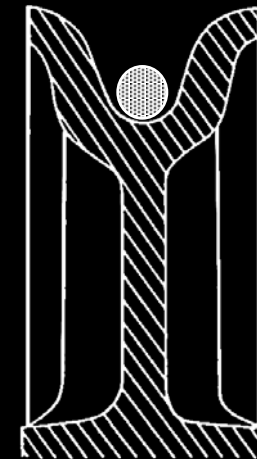
- Matching the load line with sheaves.



Properly
matched rope
and sheave



Rope is
too large,
will pinch



Rope is too
small, will
flatten

Selection, Site Review & Set-Up

Sheave Gauge



Leveling the Crane

Should not rely on
manufacturer's supplied
level.



Leveling the Crane

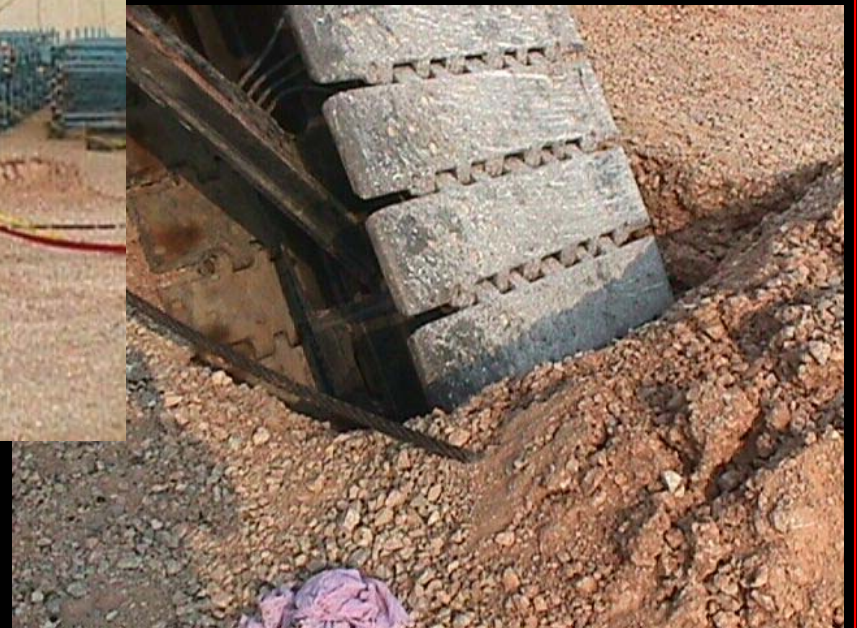
Determine if the ball is hanging parallel to the boom.



Use a 4 foot carpenter's level on a sturdy part of the crane.

Accident Facts

- Poor ground conditions.
- Not level.



Learning Opportunity

1. Before attempting to set up the crane, the employer should review the work to be done, plan the entire operation and check the following three (3) site conditions.
2. The use of blocking or cribbing performs what two (2) important functions?
3. What are four (4) considerations when placing blocking or cribbing?
4. What are three (3) considerations when determining the access and usability of cranes to the job site?